DOCUMENT RESUME

ED 298 683 EC 210 616

TITLE	Beyond Drill and Practice: Learner-Centered Software. Abstract 16: Research & Resources on Special Education.
INSTITUTION	ERIC Clearinghouse on Handicapped and Gifted Children, Reston, Va.
SPONS AGENCY	Office of Special Education and Rehabilitative Services (ED), Washington, DC. Div. of Innovation and Development.
PUB DATE	Jan 88
CONTRACT	400-84-0010
NOTE	3p.; For the original report on which this extended abstract is based, see EC 201 988.
AVAILABLE FROM	ERIC/OSEP Special Project on Interagency Information Dissemination, Council for Exceptional Children, 1920 Association Dr., Reston, VA 22091 (free).
PUB TYPE	Book/Product Reviews (072)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	*Computer Assisted Instruction; *Computer Software; Consortia; Educational Practices; Educational Research; Elementary Education; *Emotional Disturbances; Junior High Schools; *Learning Disabilities; *Microcomputers; Middle Schools; *Research and Development Centers; Special Education; Teacher Education
IDENTIFIERS	*Learner Centered Instruction

ABSTRACT

This one-page abstract describes a report titled "Microcomputers in Special Education: Beyond Drill and Practice" by Susan Russell, which focuses on a project that created a consortium to promote research, training, and dissemination in learner-centered software for elementary and middle-school students with learning disabilities and emotional disorders. Members of the consortium included the Technical Education Research Center, Lesley College (a teacher training institution in Cambridge, Massachusetts), the Massachusetts Department of Education, local education agencies, and members of the research community. Activities carried out by the consortium have included: (1) a national survey of teachers and administrators on the use of learner-centered software; (2) identification of promising practices; (3) establishment of a local special interest group of educators using learner-centered software; (4) development of a practicum course in the use of such software; (5) establishment of research collaborations to explore such activities as using word processors to teach writing, involving learning-disabled students in scientific investigations, and teaching below-grade-level children to understand mathematical concepts without the burden of calculation; and (6) preparation of a handbook for special educators. (JDD)

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ERIC/OSEP SPECIAL PROJECT ON INTERAGENCY INFORMATION DISSEMINATION

RESEARCH & RESOURCES ON SPECIAL EDUCATION

ABSTRACT 16
JANUARY 1988

BEYOND DRILL AND PRACTICE: LEARNER-CENTERED SOFTWARE

Learner-centered software is defined by four characteristics: (a) students have control of the goal of the activity or strategies to reach that goal, or both; (b) it provides feedback that is informational, not judgmental; (c) it encourages prediction and successive approximation—using feedback from the computer, students gradually alter their responses to more closely approach the desired result; and (d) it provides a meaningful context that emphasizes intrinsic motivation. Learner-centered software includes interactive games, simulations, tutorials, problem-solving software, and tools such as word processing software, spreadsheets, and data bases.

Microcomputers in Special Education: Beyond Drill and Practice is a project that created a consortium to promote research, training, and dissemination in learner-centered software for elementary and middle-school students with learning disabilities and emotional disorders. Members of the consortium included the Technical Education Research Centers (TERC), Lesley College (a teacher training institution), the Massachusetts Department of Education, local education agencies, and members of the research community. Begun under a grant from the U.S. Office of Special Education Programs, the consortium is being continued by TERC and has received a grant from the Lotus Development Corporation. Activities carried out by the consortium include:

- Conducting a national survey of the use of learner-centered software.
- Conducting a survey of promising practices.
- Establishing a local special interest group of educators using learner-centered software.
- Developing a practicum course in the use of such software.
- Establishing research collaborations to further explore its impact.
- Writing a handbook for special educators.

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The consortium conducted a survey of the use of learner-centered software by special education departments. The survey was conducted through telephone interviews with 35 administrators and 33 teachers from a national random sample of school districts. Most of the teachers had in-classroom access to one computer, and slightly more than half of these teachers used learner-centered software (as opposed to drill and practice software). Word processing was used most frequently.

The researchers noted that teachers did not always take advantage of the full potential of learner-centered software. Some teachers used the word processor for drill and practice—on spelling or vocabulary, for example—or for reward and motivation. Many teachers noticed a particular value in having students type their assignments. Students' perceptual motor skills increased, it was easier for them to see mistakes, and it helped to slow down impulsive students. Almost all of the teachers who used word processing software for writing assignments noted an increase in students' willingness to write. However, none mentioned using the editorial potential of word processors to improve written work.

When asked about inservice training, most teachers (about two-thirds) said they had taken inservice workshops or courses offered by educational agencies or commercial organizations. Course content usually focused on programming, most often in BASIC or LOGO; very few had learned anything about educational software other than programming languages. Even fewer had received any instruction on the uses of computers with special needs children, and none reported receiving training on how to integrate educational software into the curriculum.

When asked to identify major problems encountered in using computers, about one fourth reported no major problems. Problems mentioned by at least 10% of the sample included: (a) inappropriate or limited software, especially for particular ages or skill levels; (b) lack of computers and software; (c) not enough class time to use computers; and (d) student

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attitudes, particularly the attitude that software should have arcade features. Factors that facilitated use of computers included support from the school and community, good background or training, and having access to computers in the teacher's own classroom.

PROMISING PRACTICES

To identify promising practices, the project used journal announcements and telephone interviews. It gathered information on software in use, goals and strategies, and teacher-to-teacher advice. For example, one program simulates a mystery story in which students play the role of detective: They collect clues by interviewing characters in the story. This software was used with students who had learning disabilities and were behind in reading and writing skills. They learned to use maps, keep good notes, and read information in the booklet. They also learned that they could not solve the case by guessing. In addition, the software improved students' organization, communication, and cooperation.

LOCAL SPECIAL INTEREST GROUP

The Microcomputers in Special Education/Special Interest Group (MicroSIG) is an ongoing network of teachers, administrators, researchers, and graduate students. In addition to holding monthly meetings, the SIG has a newsletter and lending library of learner-centered software. Membership is open to all interested persons in the Boston area. (Information on the SIG is available from Peggy M. Kapisovsky, Director, MicroSig, Technical Education Research Centers, 1696 Massachusetts Avenue, Cambridge, MA 02138 617/547-0430.)

PRACTICUM COURSE

The project also developed a practicum course that combines a seminar with field work and is provided in Lesley College's graduate program. It gives participants direct experience in using learner-centered software with students with special needs.

RESEARCH COLLABORATIONS

Several interesting research activities emerged from the project. One survey examined teachers' goals in using word processors to teach writing and any changes that emerged in their teaching. Findings indicated that use of the word processor had led to few changes in the student's task but strong changes in learning organization. The teachers reported more involvement in the writing process, lower management time, and more student independence. These changes were accompanied by changes in teacher attitudes, especially regarding student independence, student and teacher roles, and goals.

Three other research projects are currently being conducted. One is investigating microcomputer-based laboratories that actively involve students with learning disabilities in scientific investigations. Another study, the "Special Education Classroom of the Future," is being funded by Apple computers. In addition, pilot research is being conducted to find out how children who are below grade level understand and apply mathematical concepts when they are relieved of the burden of calculation.

HANDBOOK FOR SPECIAL EDUCATORS

The collection and synthesis of knowledge from practice—what worked with which students under what circumstances—is an invaluable resource for educators. Experiences gained from both the regional collaborative and the national search for promising practices will be described in a handbook entitled *Beyond Drill and Practice: Using Learner Centered Software in Special Education.* The book will address such topics as supporting skill development, teaching writing, developing problem solving and critical thinking skills, and improving "learning to learn" skills such as motivation, responsibility, and independence.

Microcomputers in Special Education: Beyond Drill and Practice. Final Report. 1987. 20 pp. plus appendices. Susan Jo Russell, Technical Education Research Centers. U.S. Department of Education Grant No. G008430071. Available for $.82 (microfiche), plus postage, from ERIC Document Reproduction Service, 3900 Wheeler Avenue, Alexandria, VA 22304 (1-800-227-3742). Order EC number 201 988. The report is also available in hard copy from the Technical Education Research Centers.

ERIC's Special Project on Interagency Information Dissemination is designed to provide information about research in special education, in particular, research funded by the Division of Innovation and Development, Office of Special Education Programs, U.S. Department of Education. This product was developed by the ERIC Clearinghouse on Handicapped and Gifted Children under contract No. 400-84-0010 with the Office of Special Education Programs, U.S. Department of Education. The content, however, does not necessarily reflect the position of OSEP/ED and no official endorsement of these materials should be inferred.

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